

**Bud Phelps Wildlife Management Area  
Annual Wetland Monitoring Site Report  
2000-2001**

**I. Introduction**

This is a report of volunteer wetland monitoring activity at the Bud Phelps Wildlife Management Area for the years 2000 and 2001. The site was first monitored in the fall of 2000, but no annual report was written for that year, so the fall 2000 data will be included in this report.

**A. Site Description**

The Bud Phelps Wildlife Management Area is a mitigation wetland created in 1995 by Pacificorp. It consists of a large pond with two islands for waterfowl nesting. The water source is the nearby Spring Creek canal. The site is approximately seven acres. Most of the site is open water adjacent cattails and other wetland vegetation, surrounded by upland grasses. A line of large trees borders the northeast side of the wetland, and willows are on the southeast side. In 1996, the site was seeded with upland vegetation seed (tall wheatgrass, alfalfa, sweet clover, and saltgrass). It was expected that emergent vegetation (hardstem bulrush, cattail, and sedges) would be established by natural seeding from Spring Creek Canal.

Open space devoted to agriculture and wildlife management surround the entire site. A gated access road ends about 1/8th of a mile from the site, and a footpath leads to, and around, the ponds. Pheasant and waterfowl hunting occur at the site various times of year. Hunters park at the gravel parking lot and access the site by foot.

**B. Monitoring Group Description**

Bud Phelps is monitored by students enrolled in environmental education classes at Mountain Crest High School in nearby Hyrum. Each fall (September-October) and spring (April-May) approximately 30 students visit the site over a two-week period. Before the actual monitoring, students receive approximately 4 hours of in-class training in monitoring protocols. The students usually spend 2 hours at the site during each visit. Some students are enrolled in the class both in the fall and spring and therefore visit the site twice during the school year, but most are one-time monitors. Division of Wildlife personnel (the Wetland Monitoring Coordinator and a Wetland Specialist) are present and oversee the monitoring during all site visits.

**C. Dates Monitored**

The Bud Phelps site was monitored in October 2000, late April and early May 2001, and late September and early October 2001.

## II. Data

### A. Water Quality

Water quality parameters have been measured at the site 10 times. Results are listed in Table 1. Water quality results are compared to the State of Utah's Water Quality Standards for Aquatic Wildlife, Class 3C. Waters in the 3C class are "Protected for non-game fish and other aquatic life, including the necessary aquatic organisms in their food chain." Individual parameters are discussed below.

Table 1. Water quality measurements at Bud Phelps WMA, 2000-2001

Parameter	units	Fall 2000			Spring 2001			
		Oct 11	Oct 17	Oct 26	Mar 23	Apr 25	Apr 26	May 8
pH		6.5	7	8	6.5	7.5	8	8
Phosphorus	mg/l	1	0.2	<.1	n/a	.1	.15	.2
Nitrate	mg/l	0	0	0	0	n/a	n/a	n/a
Diss. Oxygen	mg/l	6	12	9	5	12	10	12
Turbidity	cm	16.5	23.9	22	<6.25	12	15	9
Turbidity	NTUs	50	30	35	>240	90	65	150
Rain in last 72 hrs	inches	1.25	0	.06	.58	0	0	0
		Fall 2001			UT Aquatic Wild-			
		Sept 25	Oct 2	Oct 18	life Standards 3C			
pH		8	7.5	7.5	6.5-9.0			
Phosphorus	mg/l	0.3	0.3	0.1	no standard			
Nitrate	mg/l	0.2	0.1	0.2	4.0			
Diss. Oxygen	mg/l	5	7	9	3.0			
Turbidity	cm	20.7	15	48				
Turbidity	NTUs	40	65	12	increase of 15			
Rain in last 72 hrs	inches	0	0	0				
Water Temperature	Celsius	16.5	14.9	10.6	27			

**pH:** pH is a measurement of how acidic or how basic the water is. For fish and most macroinvertebrates, optimum pH is between 6.5 and 9.0. All pH measurements at Bud Phelps fell within this optimum range.

**Phosphorus:** Phosphorus is an important plant nutrient; however, too much phosphorus in a water body can cause excess plant growth in the water. Utah does not have a phosphorus standard for 3C waters, but in other waters the standard maximum level is 0.05 mg/l. Phosphorus measurements at Bud Phelps exceeded 0.05 mg/l at each sampling.

**Nitrates:** Nitrate, a form of nitrogen, is another important plant nutrient. Like phosphorus, too much nitrate can result in excess plant growth. Utah's class 3C maximum standard for nitrate is 4 mg/l. All measurements of nitrate at Bud Phelps fell far below the maximum.

**Dissolved Oxygen:** Dissolved oxygen, or DO, is important to the fish and macroinvertebrates that live in the water. DO levels in water fluctuate with elevation, water temperature and salinity

as well as diurnal changes in plant photosynthesis and respiration. For class 3C waters, the Utah 1-day minimum standard is 3.0 mg/l. All DO measurements at Bud Phelps meet this standard.

**Turbidity:** Turbidity is a measurement of the solids suspended in the water. Less suspended solids mean that light can penetrate farther into the water, producing a lower measurement of turbidity. The Utah class 3C standard for turbidity is a change of 15 NTUs from the established natural level of turbidity for the particular water body; however, no natural level of turbidity has been established for Bud Phelps. The turbidity measurements at Bud Phelps have ranged from a low of 12 NTUs to one measurement in excess of 240 NTUs (following a precipitation event and early in the season when few aquatic macrophytes were present to buffer the wind).

**Water Temperature:** Water temperature is monitored because it greatly affects fish and macroinvertebrates. The Utah class 3C maximum water temperature standard is 27 degrees Celsius. All water temperature measurements at Bud Phelps (begun in the fall of 2001) have been below the maximum standard.

## **B. Macroinvertebrates**

Macroinvertebrate samples have been collected at Bud Phelps six times since monitoring began. The samples are at the USU Bug Lab where they will be sorted and identified to the lowest taxonomic level. Macroinvertebrate groups found at Bud Phelps include Ephemeroptera (mayflies) Odonata (dragonflies and damselflies), Chironomidea (midge and mosquitoes), Diptera (flies, e.g. crane flies), Coleoptera (beetles), Amphipoda (shrimp and scuds), Isopoda (sow bugs), Gastropoda (snails), Oligochaeta (worms) Hirudinea (leeches), and Hemiptera (water bugs, e.g. water boatman). Certain groups such as Odonata appear seasonally while Hemiptera and Amphipoda can be found year round.

## **C. Hydrology**

In October of 2000, a staff/crest gauge was installed at Bud Phelps, to measure changes in the water level. The gauge is read each time the site is visited. Water levels in centimeters are recorded in the following table.

<b>Date</b>	<b>Water Level (cm)</b>
<b>11-Oct-00</b>	47
<b>17-Oct-00</b>	46
<b>03-Mar-01</b>	27
<b>25-Apr-01</b>	18
<b>26-Apr-01</b>	18
<b>18-Oct-01</b>	47
<b>10-Apr-02</b>	22

The water levels show a pattern of high water in the fall, and low water in the spring. From the levels that have been measured, it appears that for the past two years, the water level was raised in the fall, but not in the spring. This appears to be due to the timing and flow of water in the Spring Creek Canal, the source for Bud Phelps WMA.

According to the “Cutler Wetland Mitigation Planting and Monitoring Plan” put out by PacifiCorp, at this stage in the Plan (2001-2002), the water is supposed to be maintained at a high level (approx. 4 foot depth) from April 1 to June 14, fluctuate from June 15 to September 30, then be filled to the high level again on October 1. The purpose of maintaining the high water level in the spring is “to provide habitat for waterfowl nesting and brood rearing”. However, drawdowns are also prescribed if needed “to enhance vegetation or to control carp”. It is not known if the low water levels recorded in the spring are the result of deliberate drawdown to enhance vegetation or an change in water level management strategy of the WMA.

#### **D. Birds**

Birds have been monitored at Bud Phelps a total of five times: twice in the fall of 2000, twice in the spring of 2001, and once in the fall of 2001. The table below lists each bird seen (x indicates a species was present; the number of individuals seen is listed when possible).

<b>Common Name</b>	<b>Oct 11, 2000</b>	<b>Oct 17, 2000</b>	<b>Apr 26, 2001</b>	<b>May 8, 2001</b>	<b>Sept 25, 2001</b>
American Avocet				x	
American Coot		x			
American Goldfinch		x			1
American Robin	x				
Black-capped Chickadee		x			1
Brewers Blackbird		x			
Canada Goose			x	x	
Crow					1
European Starling		x			
Great Blue Heron		x			
Magpie		x	x		4
Mallard	x		x	x	
Marsh Wren					1
Norther Harrier					2
Northern Flicker		x			
Northern Pintail		x			1
Plover					1
Redhead			x		
Red-tailed Hawk		x			1
Red-winged Blackbird		x	x	x	7
Ring-necked Pheasant		x	x		
Sandhill Crane			x		1
Seagull			x	x	
Turkey Vulture					20
Unknown Duck		x			12
Unknown Finch					8
White-crowned sparrow	x	x			
White-faced Ibis			x		
Yellow-headed blackbird			x	x	
<b>Total Species Observed</b>	<b>3</b>	<b>14</b>	<b>10</b>	<b>6</b>	<b>14</b>

The one bird species most commonly observed at Bud Phelps is the red-winged blackbird (seen four out of five monitoring times). Species seen three out of five times are black-billed

magpie, and mallards. The only bird seen that is rare in this area is the plover, reported in the fall of 2001. That particular bird was flying over the site, and may have been a killdeer, since they are common in the valley and are in the plover family.

The bird data are too few and variable to make any overall conclusions about the health of the bird populations at Bud Phelps. Unfortunately, some of the variation in results (i.e., observations of 3 species one week and 14 the next) may be due to variation in the expertise of the observers. Unlike some of the other monitoring protocols, bird monitoring is especially dependent upon the skill of the particular monitor(s). Additional variation may be due to time of day, and weather conditions.

## E. Wildlife

The wildlife protocol was begun in the spring of 2001, and wildlife has been monitored at Bud Phelps five times. The species observed, and method of observation, is in the following table.

<b>Common Name</b>	<b>Apr 25, 2001 Method of Obs</b>	<b>May 8, 2001 Method of Obs</b>	<b>Sept 25, 2001 Method of Obs</b>	<b>Oct 2, 2001 Method of Obs</b>	<b>Oct 18, 2001 Method of Obs</b>
Muskrat	tracks, carcass	tracks	scat	tracks	
Raccoon	tracks	tracks	scat	scat	
Red Fox	scat	tracks, scat	scat	scat	
Snake	sight		sight	sight	sight
Deer	tracks	tracks, scat	tracks	scat	scat
Leopard Frog	sight		sight		
Mice	sight			sight	
Owl					cough pellet
Coyote					scat
Domestic Cow					scat

Animals that were routinely observed (through sight or evidence) at Bud Phelps include muskrat, raccoon, red fox, snake, and deer. Several other animals, or their evidence, were observed only once. These include meadow vole, leopard frog, mice, owl, coyote, and domestic cow. Of the animals routinely observed, muskrat, snake and deer are native to the Cache Valley. Raccoons may or may not be native, while red fox were introduced with white settlers.

## F. Vegetation

Five parallel vegetation transects were established at Bud Phelps in the fall of 2000, but not monitored until the fall of 2001. Monitoring occurred on three different dates in the fall of 2001: on each date different transects were monitored, with a small amount of overlap. Therefore, the monitoring data for the three dates will be combined. This is also logical because unlike macroinvertebrates, wildlife, or birds, plants are stationary and should remain on the transects throughout the season. The table below lists the plants seen on each transect. The final column lists the plants' status as a wetland indicator. A key to the status codes is at the end of the table.

<b>Fall 2001</b>						<b>Indicator</b>
<b>Common Name</b>	<b>Transect 1</b>	<b>Transect 2</b>	<b>Transect 3</b>	<b>Transect 4</b>	<b>Transect 5</b>	<b>Status</b>
<b>Forbs</b>						
Cattail	x	x	x	x	x	OBL
Teasel	x	x		x	x	FACW
Bittersweet Nightshade	x		x			FAC
Cocklebur	x					FAC
Curly Dock				x		FAC
Poison Hemlock	x		x	x	x	FAC-
Canada Thistle	x		x	x	x	FACU
Perennial Sowthistle	x					FACU
Prickly Lettuce	x	x			x	FACU
Yellow Sweet Clover	x					FACU
Annual Sowthistle	x					UPL
Alfalfa	x					NI
Common Burdock	x					NI
Field Bindweed	x					na
Lambs Quarters	x	x	x	x		na
Milkweed	x					dep on spp
Unknown herb	x					
Unknown white clover	x					
<b>Grasses</b>						
Reed Canary Grass	x	x	x	x	x	FACW+
Intermediate Wheat Grass	x	x	x	x	x	UPL
<b>Rushes</b>						
Baltic Rush	x		x	x		FACW
<b>Sedges</b>						
Hardstem Bulrush	x			x	x	OBL
Spikerush			x	x		dep on spp
<b>Trees &amp; Shrubs</b>						
Wild Rose	x					dep on spp
Coyote Willow	x					FACW

OBL = Obligate - 99% or greater of the individuals of a species occur in wetlands

FACW = Facultative Wetland - 66-99% of the individuals of a species occur in wetlands

FAC = Facultative - 33-66% of the individuals of a species occur in wetlands

FACU = Facultative Upland - 1-33% of the individuals of a species occur in wetlands

UPL = Upland - less than 1% of the individuals of a species occur in wetlands

NI = No Indicator

na = No indicator information available on this species

dep on spp = Indicator status is variable, depending on which particular species is present

Many more plants are seen on transect 1 relative to the other transects, because it runs along the side of the wetland water body. The other four transects cross the water body and therefore run across much less land.

Plants found on all transects include cattail, intermediate wheatgrass, and reed canary grass. The next most common plants (found on four of five transects) are Canada thistle, lambs quarters, poison hemlock, and teasel.

Two species found on the site, cattail and hardstem bulrush, have 'Obligate' wetland

indicator status. Since virtually all cattails and hardstem bulrush are found on wetlands, that indicates that the Bud Phelps area does indeed merit wetland status. The existence of these species on the site also confirm that the assumption that inflow from the canal would establish emergent vegetation, was correct.

Four species are 'Facultative Wetland' indicators, four are 'Facultative' indicators, four are 'Facultative Upland' indicators, and two are 'Upland' indicators. A few species, which we could not identify past the genus level, may be wetland indicators, depending on which species they actually are. (For example, some species of *Asclepias* [milkweed] are obligate, some are facultative wetland, etc. on down to no indicator status). The remaining species observed are either not wetland indicators, or were not on the list of wetland indicator plants.

Noxious weeds found at Bud Phelps are: field bindweed, Canada thistle (Utah state noxious weeds), and poison hemlock (Cache county noxious weed).

## G. Land Use

Land use was monitored once at Bud Phelps, in October of 2001. Land use can be monitored less often than the other parameters, since it tends to change less quickly. The land uses recorded are:

Category	Cover Class	Percent
Residential, Single Family		
Residential, Multi Family		
Commercial		
Industrial		
Agriculture	3	26-50%
Roads (paved)		
Roads (dirt)	1	0.5-5%
Bare Ground	4	51-75%
Other		

The 'agriculture' occurring near Bud Phelps appears to be pasture for livestock. The 'bare ground' is upland meadow that is part of the wildlife management area.

Other activities were also recorded as having occurred in the area. These were:

draining, channelization	non-native plants
impounding	RV tracks
draining	livestock access
light recreational use	clearing

### **III. Conclusions**

#### **A. General**

The Bud Phelps mitigation site appears to be progressing in its development as a wetland site. The water quality parameters are in acceptable ranges, with the possible exceptions of phosphorus and turbidity (in the spring). The plant species observed indicate that emergent vegetation is being established from the seed source in the canal.

#### **B. Recommendations**

Continue monitoring the site seasonally. During water quality testing, pay particular attention to phosphate and turbidity measurements, perhaps using a more sensitive test for phosphate. Also, continue vegetation monitoring to see if additional wetland plant species (such as sedges) become established. Consult with WMA managers to clarify current water level management strategy at the pond.

#### **C. Monitoring Photos**

The following photos were taken by Mountain Crest High School students in the Spring of 2002, during a monitoring training session.



Bud Phelps WMA pond





Vegetation Plot flag



Bird monitoring station



Staff/crest gauge



Mountain Crest teacher and students, monitoring water quality